large numbers in 95 per cent. In a series of 103 adenoids pneumococcus occurred in 65 per cent,—2 per cent of which were type II, 13 per cent type III and 85 per cent type IV. In the nasopharyngeal swabs of 21 persons the pneumococcus was recovered in 71.4 per cent and from the tonsils of the same persons in 66 per cent and the adenoids in 71 per cent. They occurred more numerously in the crypts than in the swabs. Streptococcus viridans was found in 89 per cent of adenoids and 81 per cent of tonsils, while Streptococcus mucosus was encountered in 3 per cent of adenoids and indifferent streptococci in 12 per cent. Mather's coccus was noted in 17 per cent of adenoids. Gram-negative, pleomorphic and hemoglobinophilic bacilli, presumably Bacillus influenzæ, were isolated in 40 per cent of extirpated adenoids and in 53.9 per cent of excised tonsils from 115 persons. In the nasopharynx they were present in 40 per cent of 25 persons. B. diphtheriæ were found 12 times in the excised adenoids and extirpated faucial tonsils of 100 children, being encountered in both the adenoids and tonsils of the same individuals. Two of the 12 strains were virulent. Diphtheroids occurred in 30 per cent of the adenoids and in 17 per cent of the tonsils. In an additional investigation, MEYER, PILOT and PEARLMAN (*Jour. Infect. Dis.*, 1921, xxix, 59) found that removal of the tonsils and adenoids in children decidedly reduced the number of hemolytic streptococci and influenza bacilli, and to a less extent the pneumococci in the oropharynx and nasopharynx, but did not cause their disappearance.

Relation between the Virulence of Streptococci and Hemolysin.—STEVENS, BRADY and WEST (*Jour. Exp. Med.*, 1921, xxxiii, 223)determined the relation between the hemolysin production and the pathogenicity of five strains of Streptococcus pyogenes (Holman). Avirulent organisms were obtained by frequent transplants on blood agar for several months. The same strains were rendered virulent by repeated passages through mice, after which the virulent and avirulent forms were transplanted to horse serum broth, and fourteen to eighteen-hour cultures were seeded into trial flasks of the same media. After centrifuging, the supernatant fluid was titrated against mouse cells to determine the hemolytic titer and this was done at frequent intervals until after the maximum hemolysin production had occurred. In this way, determinations were made with actively growing organisms which were accustomed to the media in which the tests were made. The results showed that both the virulent and avirulent forms of each strain produced, at some time during their growth, approximately the same maximum hemolytic titer. There was a tendency for the original culture to grow more rapidly than the more pathogenic forms and to reach the height of hemolysin production at an earlier stage during the growth of the culture.

Acute Respiratory Infection in Man Following Inoculation with Virulent Bacillus Influenzæ.—During the past few years a large number of persons have submitted themselves to inoculation experiments where filtered or unfiltered nasopharyngeal secretions from individuals with influenza, as well as pure or mixed cultures of the ordinary bacteria, have been instilled into the upper respiratory passages. Following the observations of Blake and Cecil on monkeys, CECIL and STEFFEN

(*Jour. Inf. Dis.*, 1921, xxviii, 201) inoculated healthy human volunteers with strains of B. influenzæ, extracts of B. influenzæ, Streptococcus hemolyticus and pneumococcus. Six persons received suspensions of B. influenzæ, freshly isolated from chocolate blood agar cultures or from the peritoneal cavity of monkeys or from chocolate blood broth cultures. One volunteer was a carrier of influenzal bacilli, while three of the six had had influenza in 1918–19. All materials were administered into the anterior nares in a small quantity of fluid (0.5 to 1 c.c.). It was found that the virulent influenza bacilli excited in the volunteers "an acute respiratory disease similar in many respects to influenza, but falling short of the typical clinical picture." The authors suggested that their success could be attributed to the fact that freshly isolated, virulent strains were used and believed that fluid cultures and washings from animal exudate produced better results. Influenza bacilli, biologically identical with those inoculated could be recovered from the discharges as long as symptoms persisted and often for some time thereafter. Two individuals received filtrates of B. influenzæ cultures, both of whom showed neither local nor constitutional reaction. One of the two volunteers who were given virulent hemolytic streptococci from human sources developed an acute tonsillitis. Negative results were obtained in the two persons who received a virulent pneumococcus type IV.

Experimental Studies of the Nasopharyngeal Secretions from Influenza Patients.—Much has appeared concerning the cause of epidemic influenza in the recent literature. Positive and negative results have been obtained by various investigators employing Pfeiffer's bacillus and other organisms as well as unfiltered and filtered nasopharyngeal washings in both man and animals. OLITSKY and GATES (*I, Jour. Exp. Med.*, 1921, xxxiii, 125) inoculated rabbits with unfiltered nasopharyngeal washings, filtered washings, lung tissue suspensions (filtered and unfiltered) from previously inoculated rabbits, similar lung tissue preserved in sterile 50 per cent glycerol, bacteria and culture materials and control materials. Three c.c. of these materials were introduced directly into the lungs under light ether anesthesia, through an intratracheal catheter, by a modified Lamar and Meltzer method or by tracheotomy. The studies were performed during the first epidemic wave in 1918 and 1919, the second of the autumn of 1919, and the third in the winter of 1920. The nasopharyngeal materials were obtained from those cases of acute uncomplicated influenza which presented a sudden onset with chilliness, fever, prostration, headache, muscular pains, injected conjunctivæ, sore throat and an unproductive cough. Great reliance was placed on leukopenia affecting the absolute number of the mononuclear cells, chiefly of the lymphocytic variety. The unfiltered nasopharyngeal secretions from eight cases of uncomplicated influenza in the first thirty-six hours of the disease, and from twelve cases in the later stages of the infection, were inoculated into the lungs of rabbits. The washings from seven of the eight early cases produced fever, indisposition, listlessness, ruffled hair, conjunctivitis and a marked leukopenia in the rabbits. The symptoms began in from twenty-four to forty-eight hours after inoculation and persisted for about three days, the animal then returning to normal. If the